

# Energy Optimization Presentation

6 November, 2018

## ANDALUCIA SMART CITY

Presented by:



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Global Energy Solutions Group, Inc.

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# EUROPEAN UNION – ENERGY INITIATIVES

- The EU's **Renewable Energy Directive** sets a binding target of 20% final energy consumption and a minimum of 10% of transport fuels from renewable sources by 2020.
- As part of the **Clean Energy for All Europeans** package and the EU's **Energy & Climate Goals**, in November of 2016 the commission published a proposal to make the EU a global leader in renewable energy. This proposal mandates a significant improvement over 2020 targets, with a minimum renewable energy target of **27%** and a goal of **32%**.
- 2017 progress reports state the EU as a whole achieved 16% share of renewable energy in 2014, and 17% in 2016. Although the vast majority of EU countries are on track to reach their respective 2020 binding targets and commendable efforts are already under way, there is still significant ground to cover!
  - Ireland becomes the first country worldwide to divest from fossil fuels
  - Wales pledges to leave its remaining coal in the ground, transitioning to renewables
  - Scottish Power moves away from fossil fuels for electricity generation, switching to 100% wind power & enabling investments in renewables & power grids in the UK
  - Glasgow is the first University in Europe to divest from fossil fuels



# EUROPEAN UNION – ENERGY INITIATIVES

- With some EU countries experiencing extensive power losses due to severe storms, and winter blackouts caused by nuclear reactor shutdowns, energy optimization products and stand-alone, self-sustaining power sources can provide answers and solutions.
- Renewable energy and energy optimization can be provided and achieved through a wide variety of sources; wind, solar, tidal, geothermal, and Hydro.

Today we will be focusing on **TWO** attainable and sustainable methodologies; **POWERLINK Power Factor Correction** and a stand-alone, self-sustaining power source – the **POWERLINK PHOENIX Hydro Generator**.



# ABOUT US

**Global Energy Solutions Group** was founded in 2011 with a mission to provide specialized technical services in energy optimization, and the manufacture of power factor correction units and LED lighting. Our main area of expertise is load optimization for energy dependent clients. With proven executive leadership, and a team of highly skilled engineers and technicians, Global Energy Solutions Group is able to demonstrate excellence in performing site testing, and demonstrated success in delivering energy optimization solutions worldwide.

## **Vision**

To be a leading and trusted provider for efficient energy consumption solutions worldwide.

## **Mission**

Support and promote clean, green, secure, and economically viable energy developments to reduce our dependence on fossil fuels with the ultimate goal of decreasing the effects of global warming and reducing the carbon footprint globally.



# ABOUT US



- ▶ Phoenician Exports S.L is the leading European Distributor for Global Energy Solutions Group Products.
- ▶ We create sales through both our individual owners efforts along with establishing a dealer network throughout Europe.
- ▶ We are looking to expand this network.
- ▶ We are partnering with Global Energy Solutions Group and The Marbella Institute of Technology for future manufacturing for Distribution throughout the European Market.
- ▶ The hydrogenator is patent pending and proven technology with a 25 year insurance guarantee available for purchase.
- ▶ The power link boxes have a patent for our unique sizing equipment

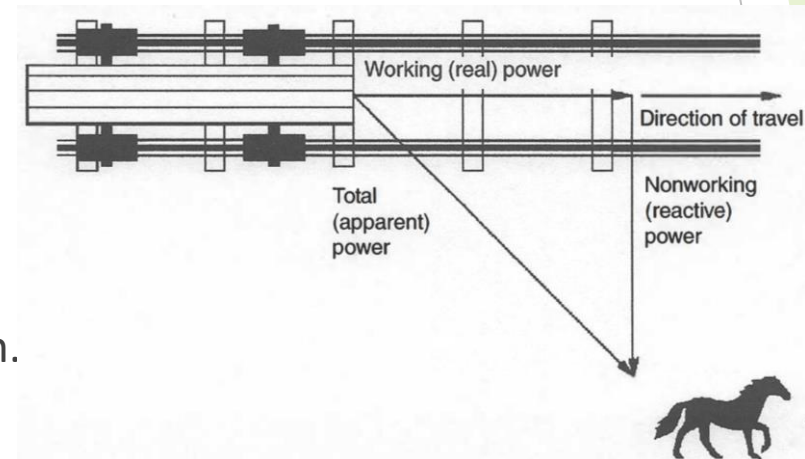
# WHY GLOBAL ENERGY SOLUTIONS GROUP?

- We are an established, global enterprise with over 10 years experience in this industry
- Proven, tenured Executive Leadership along with a global team of highly skilled technicians and engineers.
- Ability to provide multiple energy saving and energy optimization product lines under one roof.
- Our dedicated team will gain a comprehensive understanding of your requirements by conducting a location specific Energy Analysis and identify optimization opportunities. We will provide the perfect solution for your facility.
- We exhibit a continuous, passionate drive toward developing innovative energy saving and optimization technologies.



# WHAT IS POWER FACTOR?

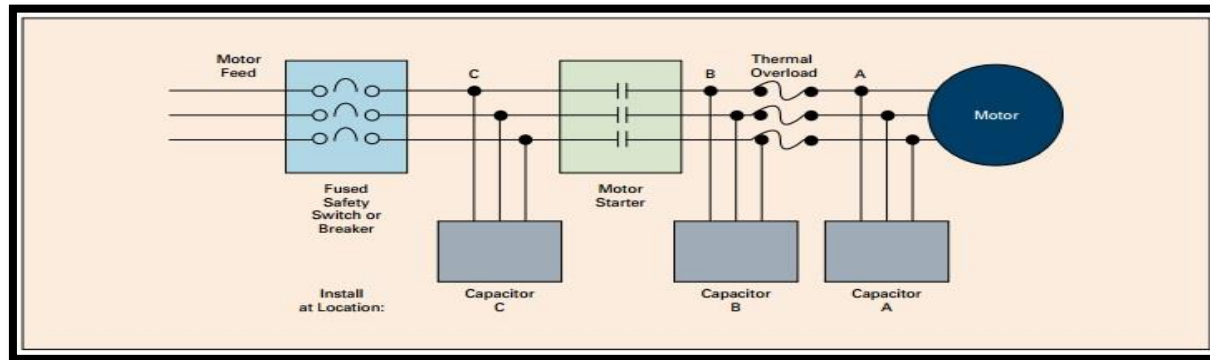
- ▶ Most loads in modern electrical distribution systems are inductive. Examples include motors, transformers, and lighting ballasts.
- ▶ Inductive loads require 2 kinds of current:
  - ▶ **Working (Real) Power** (kW) to perform the actual work of creating heat, light, motion etc.. Working Power consumes watts and is measured in kilowatts (kW).
  - ▶ **Reactive Power** (kVAR) to sustain the magnetic field. Reactive Power doesn't perform "useful work" but circulates between the generator and the load. It places a heavier drain on the power source and the power sources distribution system.
- ▶ Working Power and Reactive Power together make up Apparent Power. Apparent Power is measured in kilovolt-amperes (kVA).
- ▶ With inductive loads such as an electric motor, the Real Power performs the work and the Reactive Power supplies the magnetic field that enables the motor to spin.
- ▶ **POWER FACTOR IS THE RATIO OF WORKING POWER TO APPARENT POWER. IT MEASURES HOW EFFECTIVELY ELECTRICAL POWER IS BEING USED. A HIGH POWER FACTOR SIGNALS EFFICIENT UTILIZATION OF ELECTRICAL POWER, WHILE LOW INDICATES POOR UTILIZATION.**



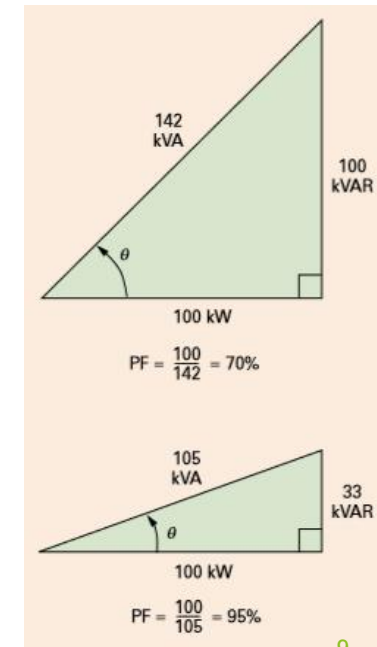


# WHAT CAUSES LOW POWER FACTOR?

- ▶ One of the most overlooked issues in energy saving initiatives today is Power Factor Correction. Having a Low Power Factor can lead to higher energy costs, poor reliability of equipment, excessive heat buildup, and can even pose safety risks in the workplace.
- ▶ Low Power Factor means you are not fully utilizing the electrical power you are paying for.
- ▶ Having a Low Power Factor happens when inductive electrical equipment such as electric pumps, transformers, air handlers, A/C units, chillers causes the voltage and current to be out of phase. When this happens it causes an increase in current on the electrical load.
- ▶ An increase in current will cause excessive heat build up resulting in an increase in repair/replacement costs of equipment, and an increase in energy costs.

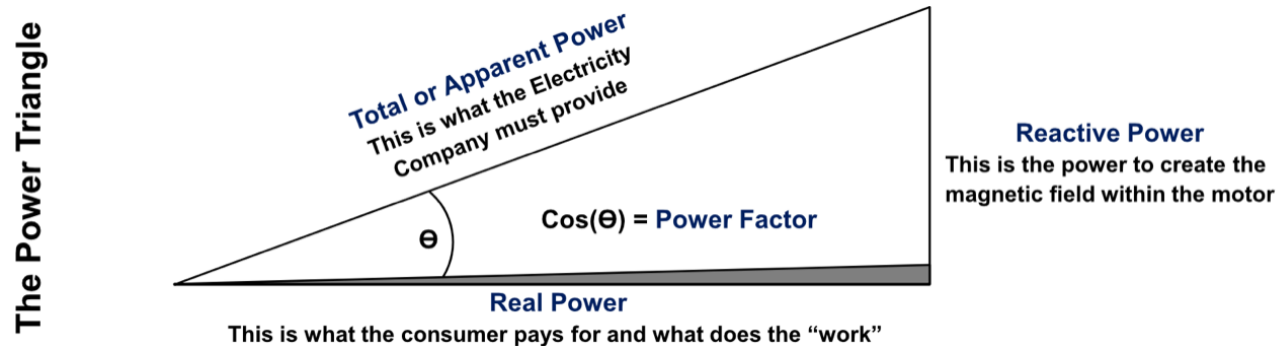


- ▶ As the triangle relationships demonstrate, kVA decreases as Power Factor increases. At 70% Power Factor 142 kVA are required to produce 100 kW. At 95% Power Factor only 105 kVA are required to produce 100 kW.
- ▶ **At 70% Power Factor it takes 35% MORE current to do the same work!**



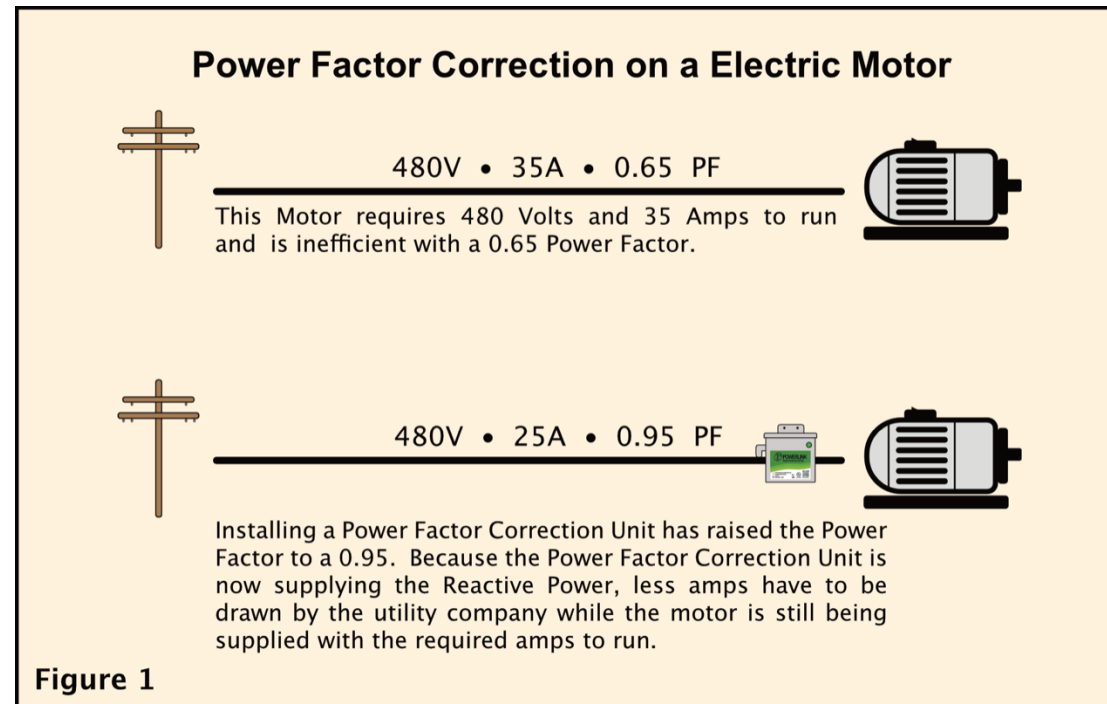
# HOW DOES IT WORK?

- ▶ Through our unique patented technology, we are able to calculate the exact amount of capacitance required to optimize the Power Factor back to unity.
- ▶ The Power Link E-Box stores reactive power needed to create the electromagnetic field required by all motors to spin.
- ▶ As the motor runs, the reactive power is stored and released from the Power Link E-Box at 60 cycles per second. The Power Link E-Box stores and releases only what the motor needs to run more efficiently.
- ▶ This unique approach reduces heat generated by inductive equipment, and in doing so also reduces the strain placed on the electrical system.
- ▶ The electricity that is normally pushed back through the power lines is grabbed and recycled by the Power Link E-Box.
- ▶ By providing a more efficient flow of electricity, our solution reduces the amount of Real Power used by individual loads. Our device collapses the Power Triangle to a state of “unity” or “Power Factor = 1” by storing and releasing the energy into the motor system.



# WHAT CAN I DO TO IMPROVE POWER FACTOR?

- ▶ You can improve your Power Factor by installing Power Factor Correction Units on your facilities electrical system.
  - ▶ When your Apparent Power (kVA) is greater than your Working Power (kW), the utility company needs to supply more reactive current along with the working current. Since Power Factor Correction Units act as Reactive Current Generators, they reduce the amount of current supplied by the utility company.



# POWERLINK PHOENIX HYDRO GENERATOR

## INNOVATIVE DESIGN

### POWERFUL PERFORMANCE

Not your traditional generator, but tomorrow's power system - Today

The PowerLink Hydro Generator is a true "Stand Alone Power Plant" that produces continuous on-demand power for commercial and industrial operations with heavy surge demands. It is a fixed Power System that operates on hydrokinetic principles.

The PowerLink Hydro Generator's breakthrough technology for the first time ever allows the production of electric hydro-power without Dam Structures or the gravitational forces of falling or flowing water. It does so without fossil fuels input and without the emission of pollutants or the production of waste. The PowerLink Hydro Generator produces electric currents using recyclable water, without "consuming the water" or any other natural resources. The System can produce power as a single unit or in a synchronized and interconnected combination of multiple units to achieve the desired capacity.

## THE POWERLINK HYDRO GENERATOR:

- ✓ Stand-Alone Power Plant for Pure Sine Wave Power
- ✓ Capable of Parallel Operation with On or Off Grid Connection
- ✓ Provides Prime / Base Load of Continual Power 24/7-365
- ✓ Ideal as Standby / Peak Surge Power Plant
- ✓ Useable to inject Grid Frequency (Components UL & GE certified for grid interception, and for sensitive equipment)
- ✓ Uses No Fuel, emits No Pollution, and produces No Waste
- ✓ Ideal for power continuity during severe weather (including Hurricanes)



- **Phoenix Power Plant available in: 25 kWh, 35 kWh, 65 kWh, 125 kWh**
- **25 Year warranty available**



# EXECUTIVE SUMMARY

- ▶ With the intense and growing focus on clean, green energy solutions it is more important than ever for businesses to incorporate energy optimization initiatives.
- ▶ Global Energy Solutions Group's portfolio of energy saving products, tenured and experienced technical team, proven track record of success, and innovative proprietary technology, position us as the perfect partner for an energy saving initiative.
- ▶ Our Power Link power factor correction line creates a "WIN-WIN-WIN" value proposition:
  - ▶ Our customers WIN through:
    - ▶ Lower electricity bills - by eliminating the flow of the reactive power throughout their facility, the customer sees a reduction in "Real Power" consumed.
    - ▶ Extended equipment life – the elimination of reactive power reduces the heat throughout the electrical grid; reduced heat equates to increased efficiencies.
  - ▶ Utility companies WIN through:
    - ▶ Less electricity to produce – by reducing the "Total Power" consumed, the utility will generate less overall electricity.
  - ▶ Global Energy Solutions Group WINS by continuing to demonstrate our Vision and Mission of delivering a cleaner, greener global environment.





# CALL TO ACTION

- ▶ Our skilled technicians will determine the most appropriate solutions for your facility to achieve maximum savings and quickest return on your investment.
- ▶ Contact us today for an Energy Optimization Analysis and start your journey toward a more profitable, cleaner, greener and environmentally responsible future!



- ▶ Does your facility have:
  - ▶ Air Handling Units
  - ▶ Air conditioning Units
  - ▶ Fans
  - ▶ Boilers
  - ▶ Chillers
  - ▶ CHW & HW Pumps
  - ▶ Elevators, Escalators
  - ▶ Fluorescent Lighting
  - ▶ Step-Down/Up Power Transformers
  - ▶ Pool Pumps
  - ▶ Refrigeration Equipment
  - ▶ Well Pumps, Waste Water pumps



# THANK YOU!

## Information Links:

Power Link E-Box, Power Factor Correction

[http://kwsos.com/PowerLink\\_Power\\_Factor\\_Correction.php](http://kwsos.com/PowerLink_Power_Factor_Correction.php)

Power Link LED Lighting Solutions

[http://kwsos.com/PowerLink\\_LED\\_Lighting\\_Solutions.php](http://kwsos.com/PowerLink_LED_Lighting_Solutions.php)

Power Link Hydro Generator

[http://kwsos.com/PowerLink\\_Hydro\\_Generators.php](http://kwsos.com/PowerLink_Hydro_Generators.php)

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